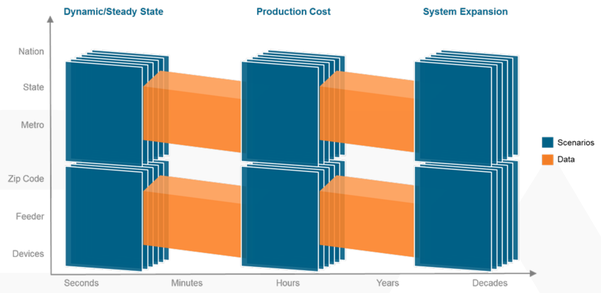
Multi-scale Production Cost Modeling

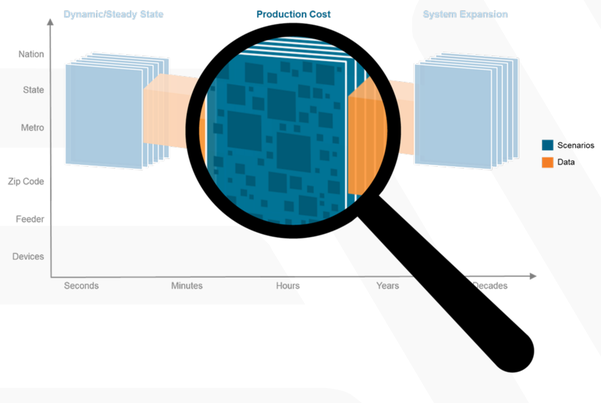
Partners: NREL, SNL, ANL, LLNL, PNNL

GRID MODERNIZATION INITIATIVE
U.S. Department of Energy

Project Description

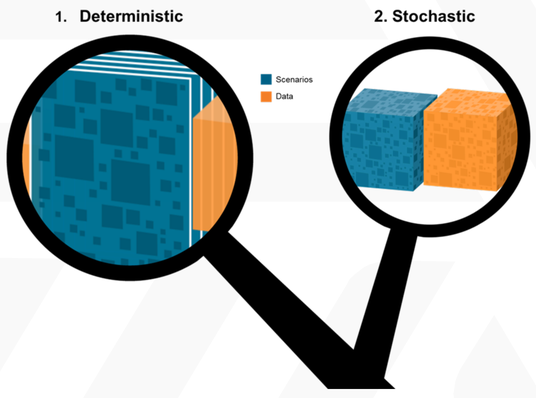
The Multi-scale Production Cost Modeling project aims to improve tools that are used to simulate power system the operations of future power systems. This project is improving the state-of-the-art in production cost modeling to enable industry to conduct more accurate analysis, faster, and in more detail.





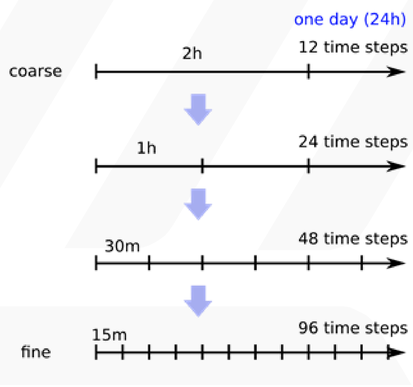
Expected Outcomes

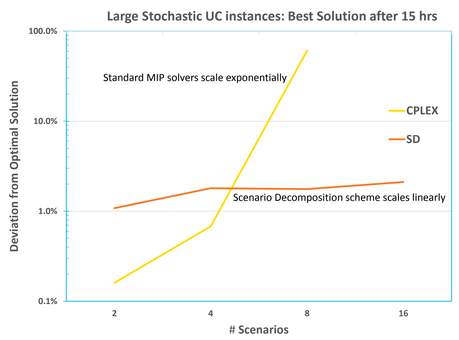
- We are developing several new algorithms, including different decompositions methods, to reduce solve time and increases model accuracy. For instance, geographic decomposition parallelizes the unit commitment problem according to market footprints. Initial results are seeing a 50% reduction in solve time. The computational advances will benefit both deterministic and stochastic analysis of the power grid.
- An IEEE Task Force recently reached out to NREL requesting help in modernizing the RTS-96 test power system which was last updated in 1996. We modernized the test system by adding modern generation resources and by adding spatial and temporal variability and uncertainty.
- By engaging with the production cost model software development and user communities, we are pursuing algorithmic and analytical advancements that can be deployed quickly and accelerate grid modernization. We are using tools such as GitHub to give a new dimension to stakeholder engagement.

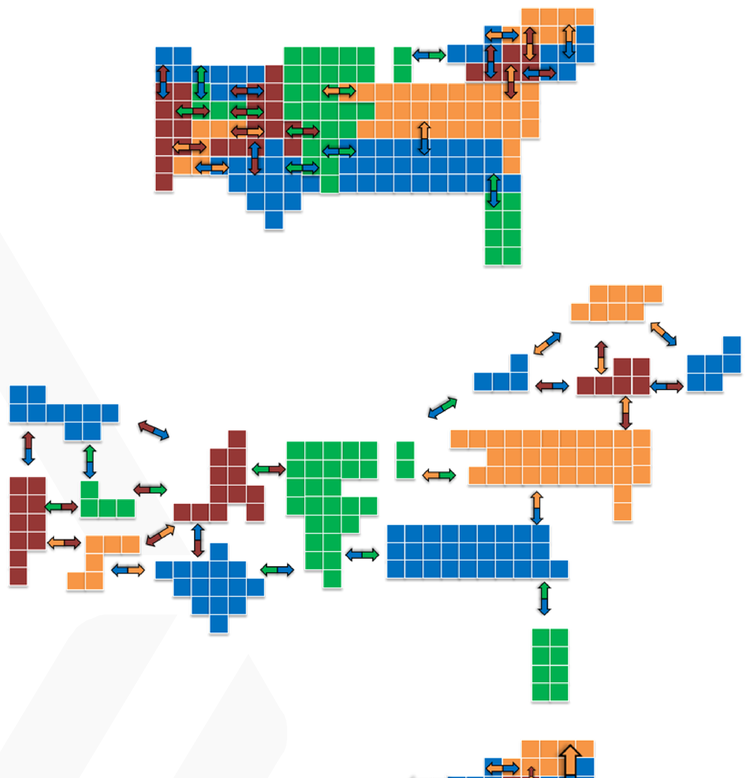


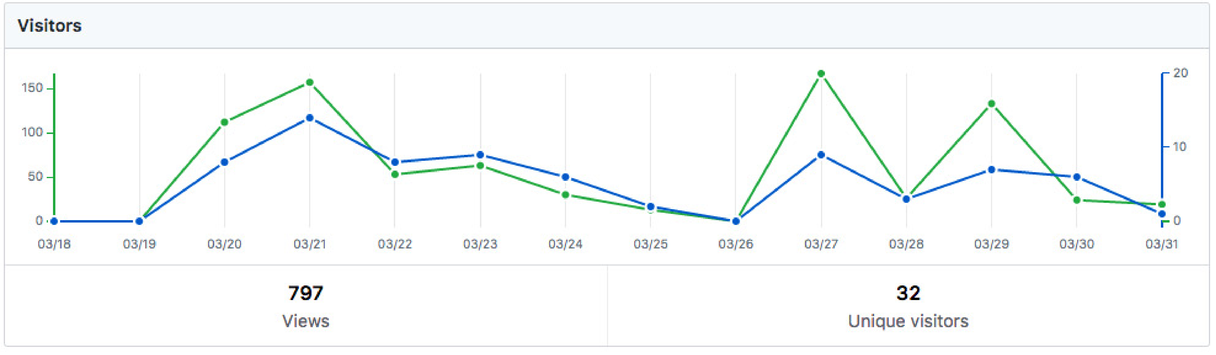
Progress to Date

- Technical Review Committee October 2016 ~40 participants
- Advanced PCM Workshop October 2016
- Creation of RTS-GMLC
- Social Coding→ GitHub
- Development of new algorithms
  - Geographic Decomposition
  - MIP Warm Start
  - Temporal Decomposition
  - Scenario Decomposition









github SOCIAL CODING

- Github.com/GridMod/RTS-GMLC
- Github.com/GridMod/MSPCM
- Github.com/GridMod/Data-Software-WG

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April 18, 2017